

**Chemical Release and Radiation Effects Satellite (CRRES) Program Archiving
and Puerto Rican Sounding Rocket Campaign**

**Final Report on NAS8-38609
Delivery Order #26**

for the reporting period 2/11/92 - 10/10/92

(NASA-CR-184503) CHEMICAL RELEASE
AND RADIATION EFFECTS SATELLITE
(CRRES) PROGRAM ARCHIVING AND
PUERTO RICAN SOUNDING ROCKET
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Introduction.

The tasks undertaken to be performed under this contract included the continued coordination and documentation of the CRRES program and the development of an archive that details, in easily accessible form, the experimental results obtained by the CRRES Program. Details of the work undertaken and results achieved are summarized in the following sections. The achievement of this goals is clearly demonstrated in the appendices attached to this report and the success, in both scientific and public relation terms, of the El Coqui rocket campaign.

Summary of the Meetings, Workshops and Special Documentation undertaken.

During the contract period, continuing coordination of the CRRES Program was accomplished and documentation of the EL Coqui Rocket Campaign was undertaken. A rocket scientist working meeting was held, as well as planning meetings. The contractor coordinated and participated in all the events listed below.

1) Sounding Rocket Meeting, Wallops Island.

March 17-18, 1992. Documentation and coordination of the meeting activities was accomplished as was preparations for the El Coqui rocket campaign in Puerto Rico.

2) Planning Meetings.

Meetings were held at Marshall Space Flight Center and at UAH in April and August for data archiving planning, experiment documentation and future working group symposia. These were attended by the P.I., Coordinator and student. Meetings were held at NASA Headquarters in May, June and August. The Project Coordinator participated at each.

3) Data Sharing

August 31 and September 3, 1992 Meetings were held for CRRES Principal Investigators to share data collected from the High Altitude Releases and the El Coqui Rocket Campaign. Meetings were held at the Holiday Inn in Washington D.C. The Project Coordinator assisted with their coordination and presented documentation.

4) Videotaping/Still Photography

The CRRES experiments held during the El Coqui Sounding Rocket Campaign were fully and successfully documented during two periods: May 13 - June 8 and June 30 to July 14, 1992. Examples are given in the appendices.

5) Press Conference

May 14, 1992 attended and participated at by the Project Coordinator and Consultant.

Development of the CRRES Archive

The initial collection and compilation of the archive was undertaken by Dr. Mary Miller at Goddard Space Flight Center. The Principal Investigator and student (Laura D. Layman) traveled to Goddard to discuss and arrange the transfer of the database to the University of Alabama in Huntsville.

The Student updated the database with the information amassed by Dr. Mary Miller. The Principal Investigator and student evaluated this document and identified gaps in the database. The student then proceeded to contact the relevant Principal Investigators with requests for updates. These requests were forwarded by e-mail, fax, telephone and regular mail where appropriate. The student then re-formatted the entire document to increase the accessibility of the database. Copies of the completed document were sent to the Principal Investigators and selected NASA personnel for comment.

A copy of the Program Directory is included in the Appendices. All updates and suggestions for improvements received before the completion of the contract have been included.

Comments received from both the Principal Investigators and the NASA personnel have been very favorable.

Bimonthly Summary of Research Activities

Feb-March 1992

- Provided support for El Coqui Sounding Rocket Meeting.
- Developed Range Charts and Schedules for upcoming rocket launches.
- Data Archive developed for the collection of research data obtained from all CRRES experiments to date.

Apr-May

- Transferred existing CRRES experiment data from Goddard Space Flight Center to UAH
- Assembled Promotional Display for the General Public and the Press Conference during the El Coqui Campaign.
- Provided support for the Press Conference.
- Documented, via still photography and videography, the beginning of the El Coqui rocket launches.

June-July

- Continued rocket launch documentation.
- Continued CRRES data collection for Archive.
- Telecommunications developed and maintained between NTC launch site, NASA officials and observation sites.
- Public Display booth manned to promote and disseminate rocket information to the general public.

Aug-Sept

- Supported High-Altitude Release and Rocket experiment data sharing.
- Presented documentation to Principal Investigators.
- Completed preliminary Program Directory containing data from all CRRES Program including High-Altitude Releases, PEGSAT, Kwajalein and El Coqui rockets.

Appendix A

NASA El Coqui Sounding Rocket Launch Windows

Rocket Designation	Rocket Number	Launch Window	Daily Window (AST)
AA-3A	18.224	5/17 - 5/29	1930 - 2030
AA-4	36.065	5/26 - 6/06	2330 - 0400
AA-30	36.064	6/01 - 6/13	0410 - 0510
NC-1	36.071	6/06 - 6/28	2300 - 0300
NC-2	36.071	6/15 - 6/28	2000 - 0400
AA-2	36.081	6/30 - 7/13	0410- 0510
AA-1	36.082	6/30 - 7/06	0410 - 0510
AA-7	36.083	7/06 - 7/13	0410 - 0510

**Appendix B.
CRRES Sounding Rockets Launched from
Tortugero, Puerto Rico.**

1. Nike-Tomahawk 18.224 UE/Ducan/Clemson

Launch Date and Time: 05-25-92, 23:52:00 GMT (7.52 PM local)
Actual Launcher Settings: 83.9 deg. QE, 340.0 deg. Az.
Actual Apogee Altitude: 293.2 km
Actual Impact Range: 187.6 km
Release Altitude: 250, 270, and 290 km (1).

2. Terrier-Black Brant VC 36.065 DE/Berhardt/NRL

Launch Date and Time: 05-30-92, 08:11:00 GMT
Actual Launcher Settings: 84.6 deg. QE, 330.0 deg. Az.
Actual Apogee Altitude: 385.4 km
Actual Impact Range: 229.8 km @ LOS
Release Altitude: 285 km on upleg.

3. Terrier-Black Brant VC 36.064 CE/Szuszczewicz/SAIC

Launch Date and Time: 06-06-92, 08:37:31 GMT
Actual Launcher Settings: 84.0 deg. QE, 357.0 deg. Az.
Actual Apogee Altitude: 367.4 km
Actual Impact Range: 175.9 km
Release Altitude: 173, 176.3 and two at 230.4 km (2).

4. Terrier-Black Brant VC 36.081 CE/Djuth/Geospace Corporation

Launch Date and Time: 07-12-92, 09:02:00 GMT
Actual Launcher Settings: 82.6 deg. QE, 313.0 deg. Az.
Actual Apogee Altitude: 368.4 km
Actual Impact Range: 200 km @ LOS
Release Altitude: 250 km (3).

5. Terrier-Black Brant VC 36.082 DE/Weber/AFGL

Launch Date and Time: 07-02-92, 09:01:12 GMT
Actual Launcher Settings: 85.0 deg. QE, 325.0 deg. Az.
Actual Apogee Altitude: 430.6 km
Actual Impact Range: 260.7 km @ LOS
Release Altitude: 250 km (3).

6. Terrier-Black Brant VC 36.083 DE/Weber/AFGL

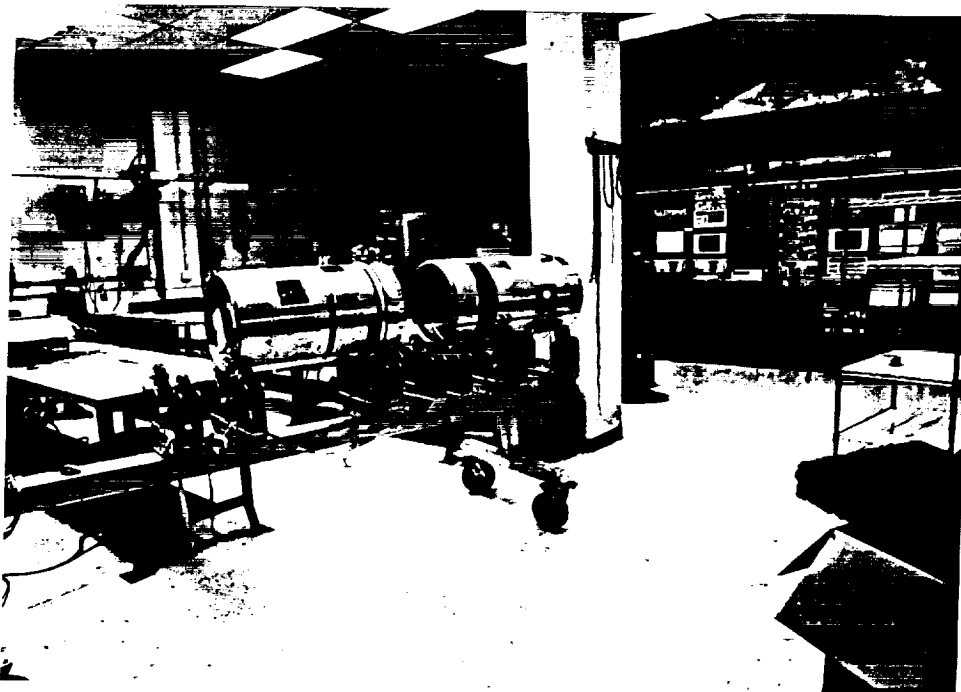
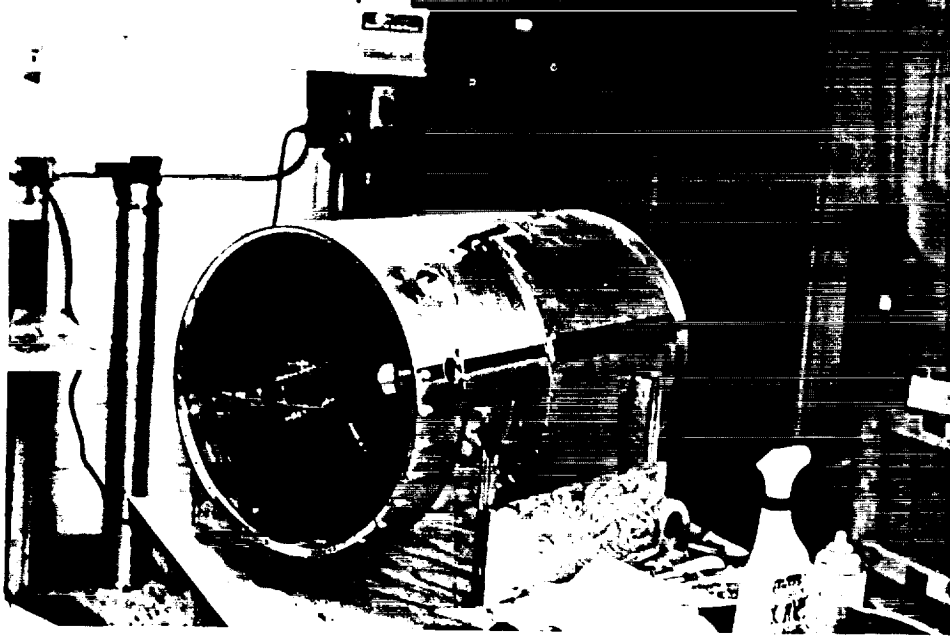
Launch Date and Time: 07-04-92, 08:58:00 GMT
Actual Launcher Settings: 82.7 deg. QE, 312.8 deg. Az.
Actual Apogee Altitude: 421.0 km
Actual Impact Range: 322 km @ LOS
Release Altitude: 250 km (3).

NOTES: (1) These are predicted altitudes. The third chemical release was not observed.

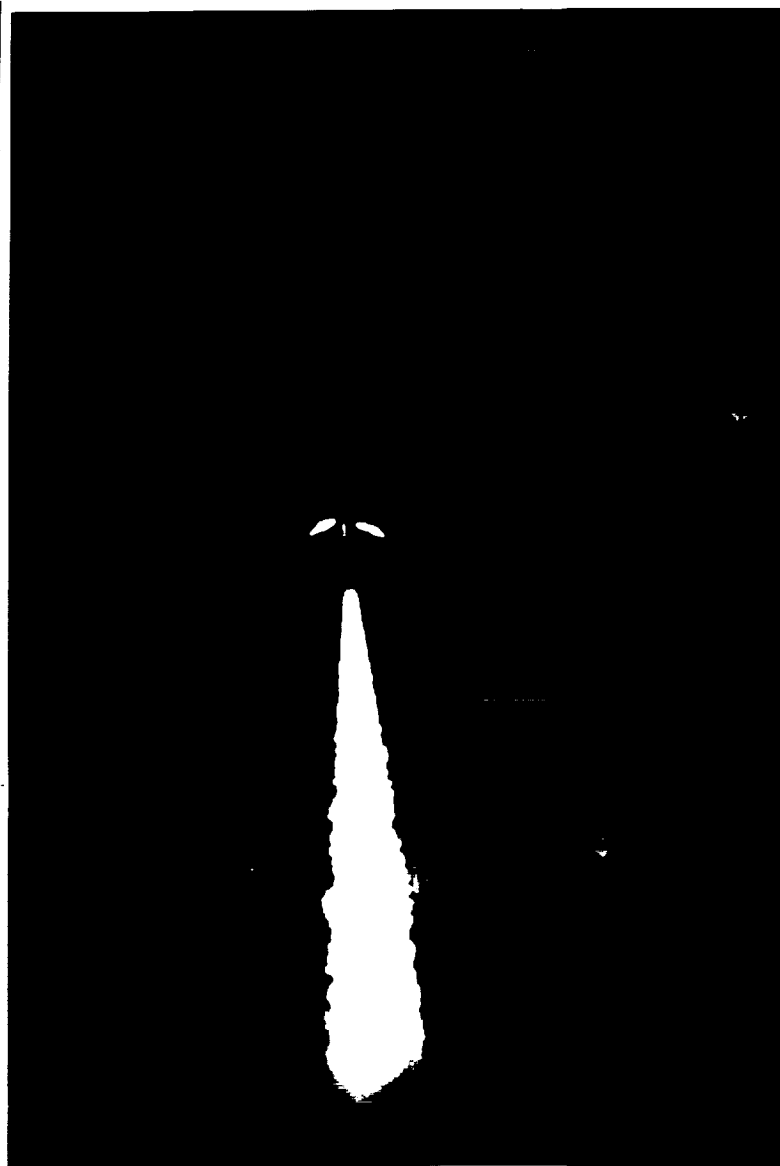
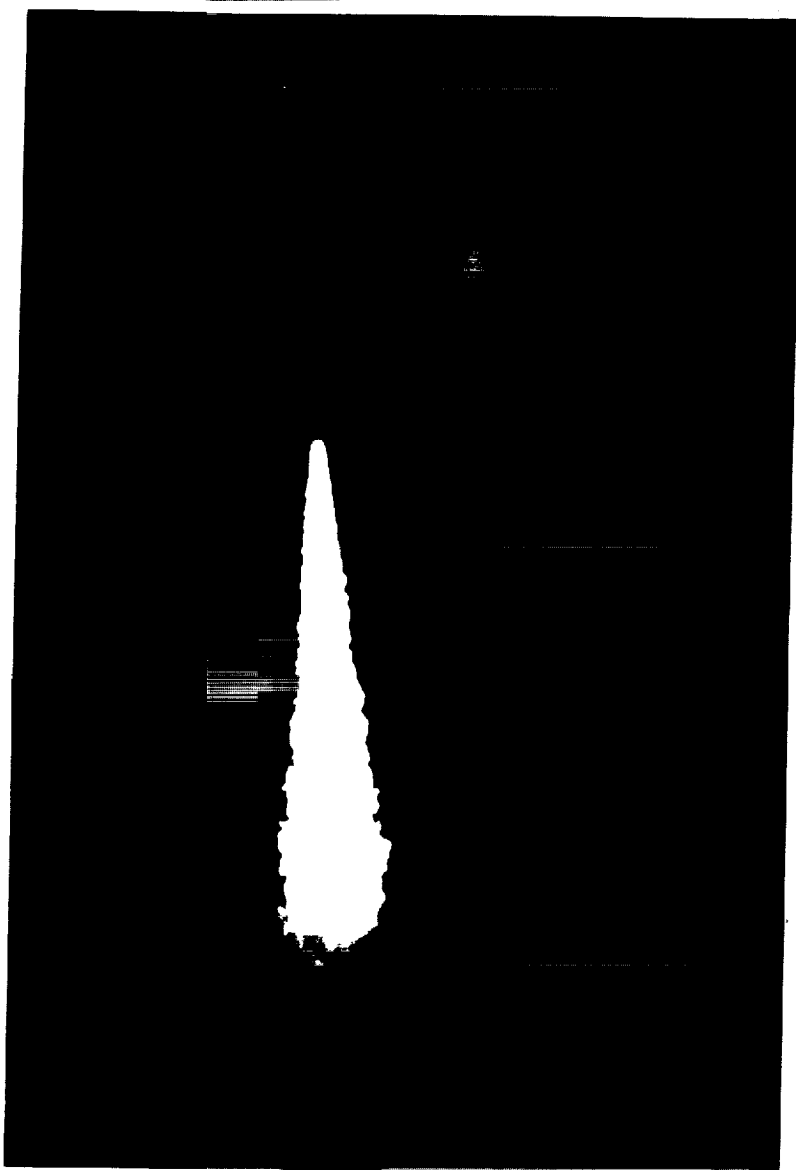
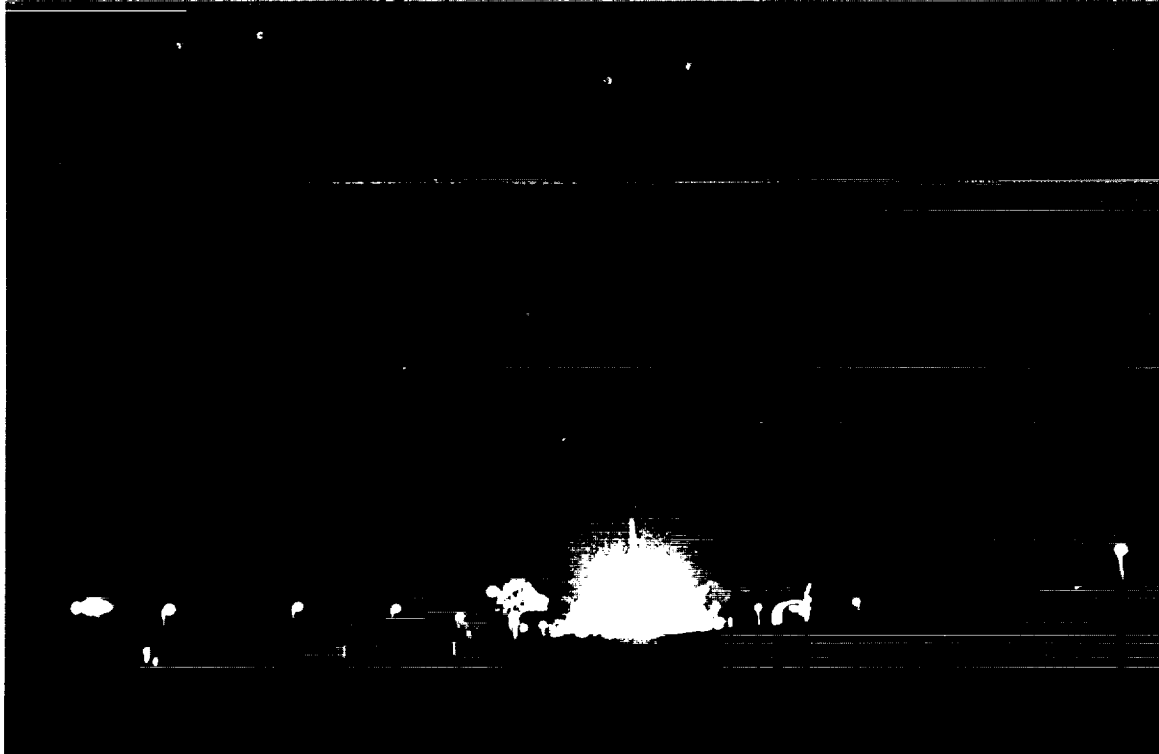
(2) These are predicted altitudes only.

(3) These values are approximate

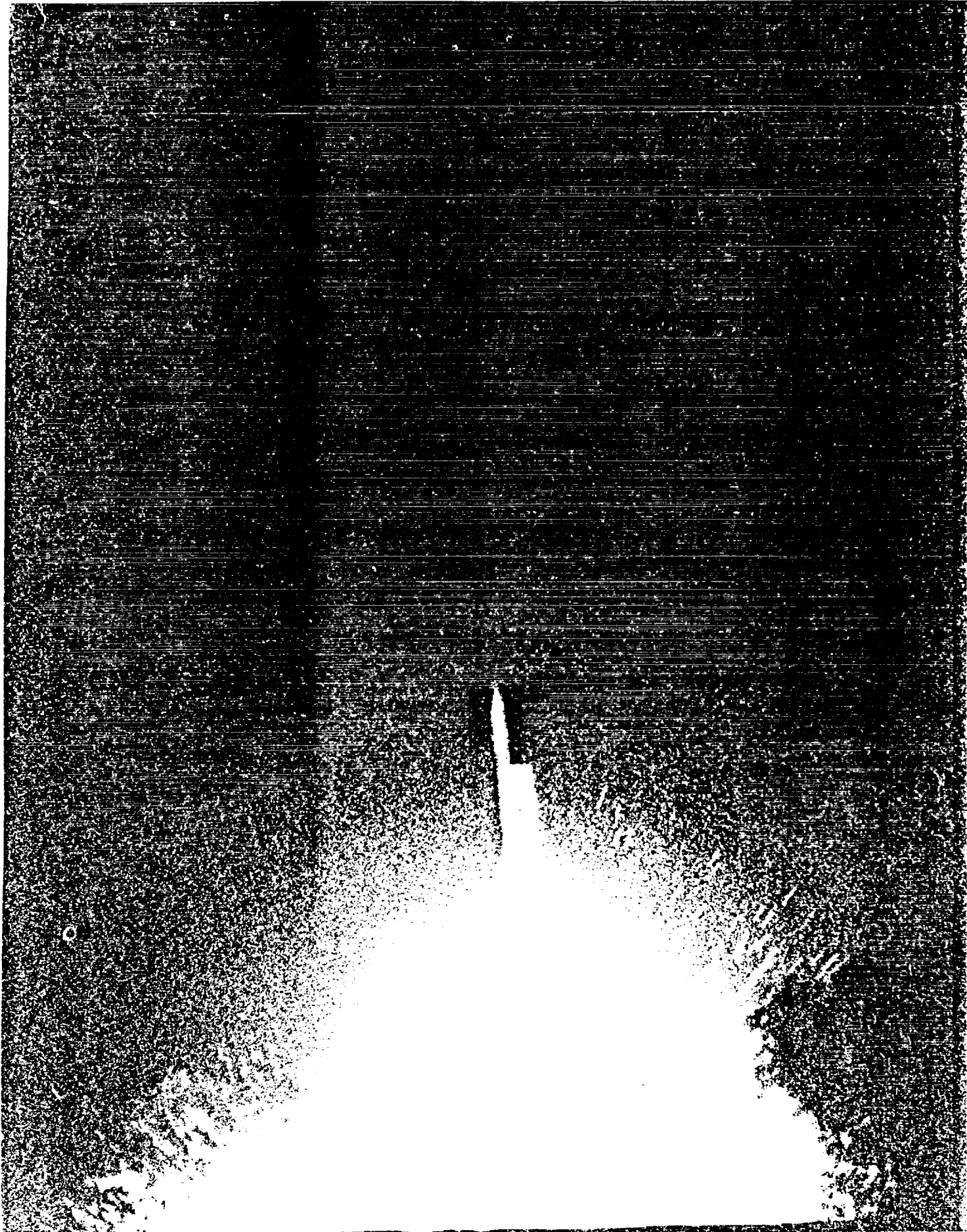
Appendix C:
Examples of Still Photographs taken throughout the Contract.



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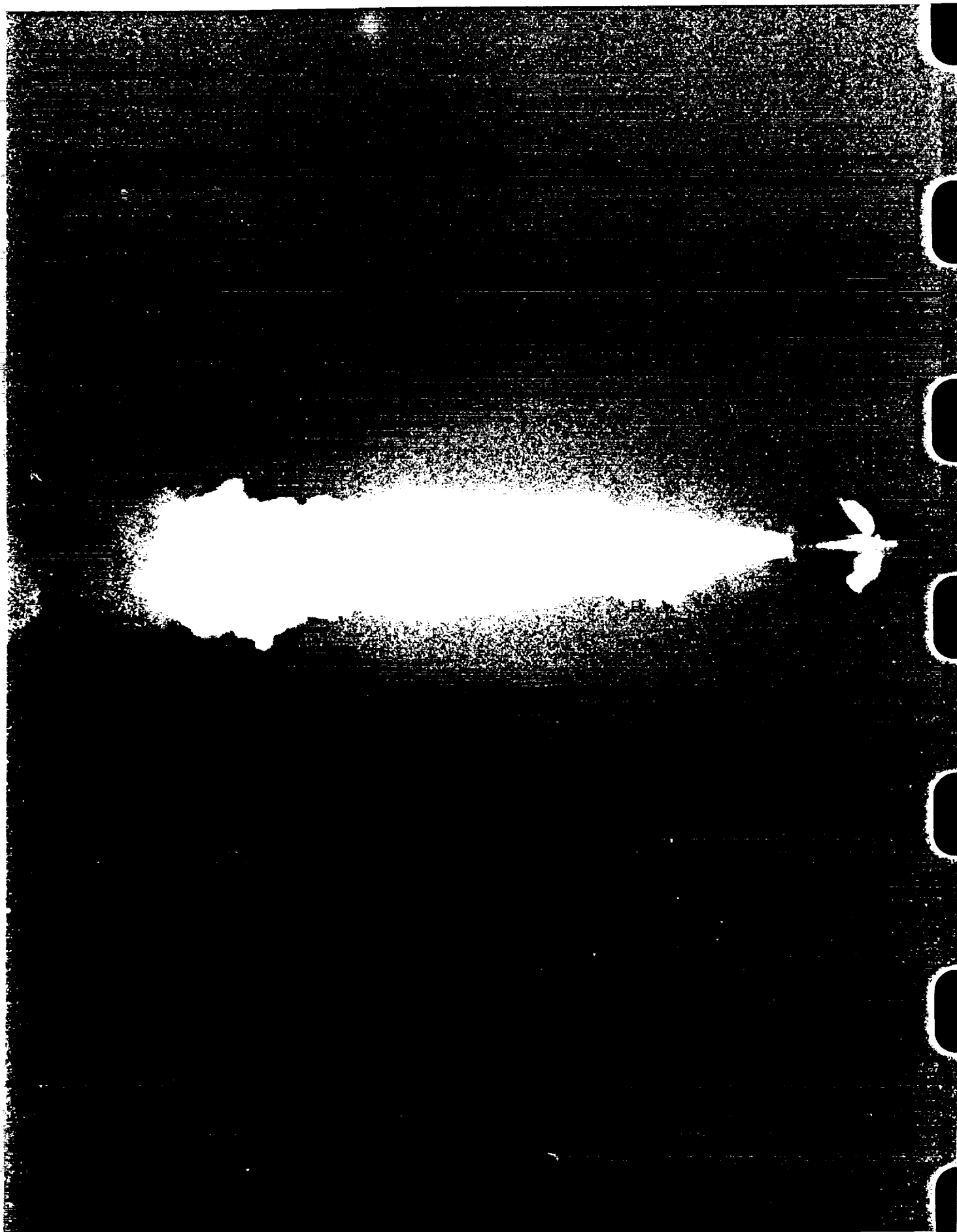


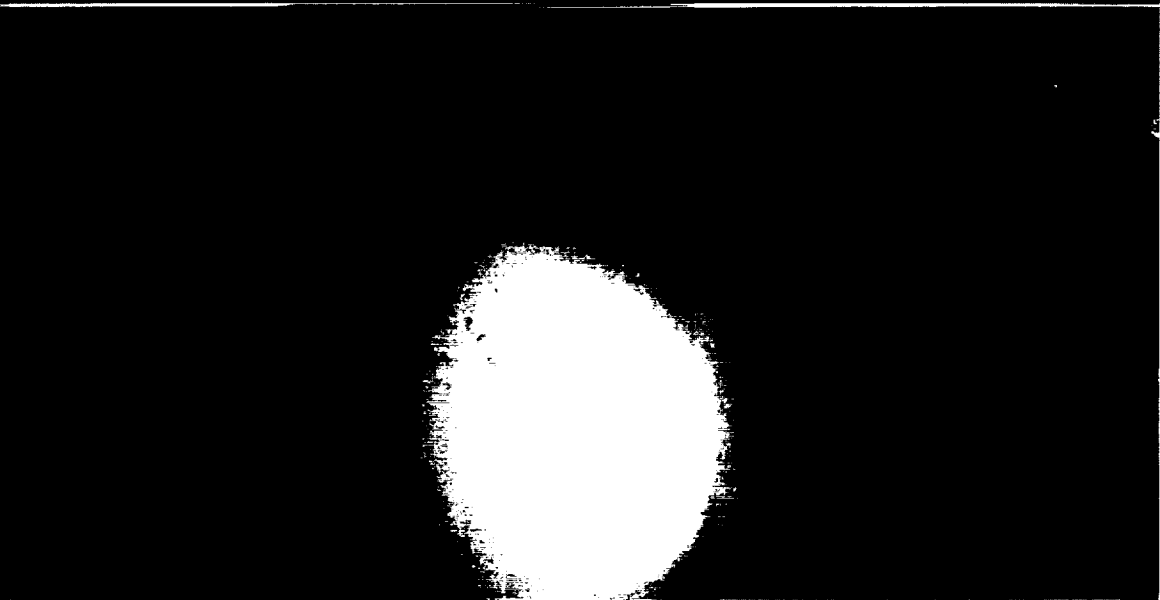
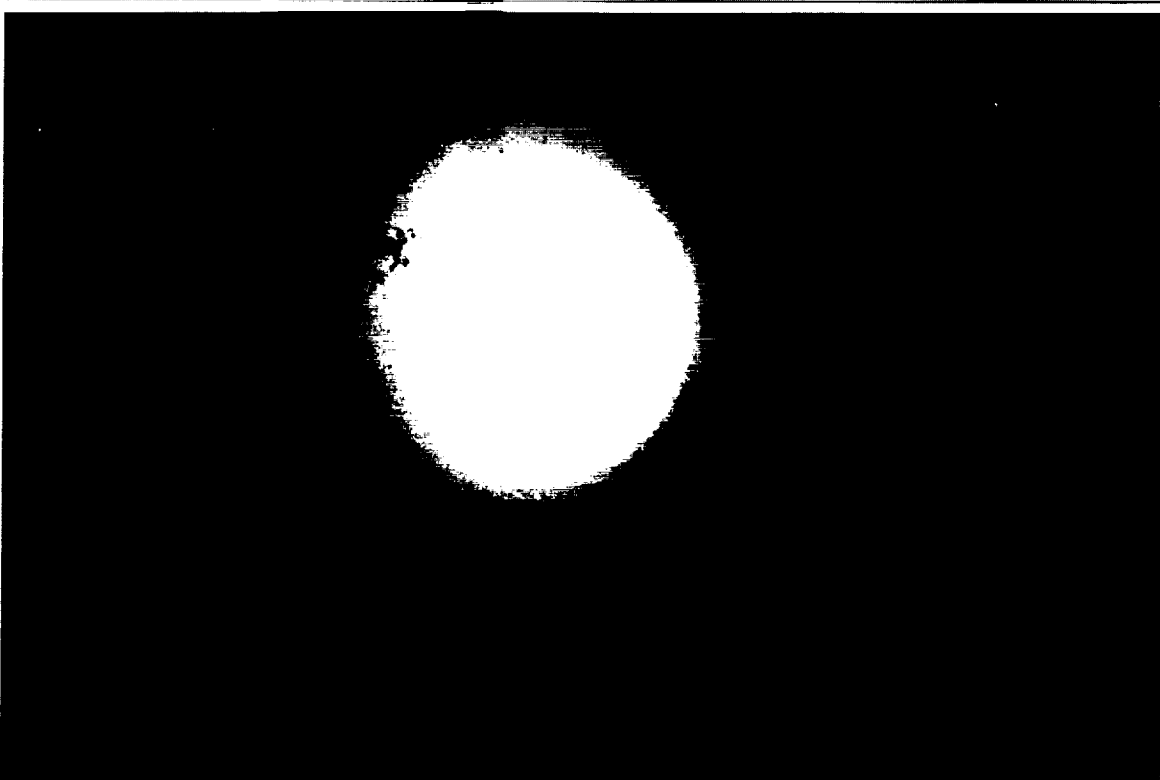
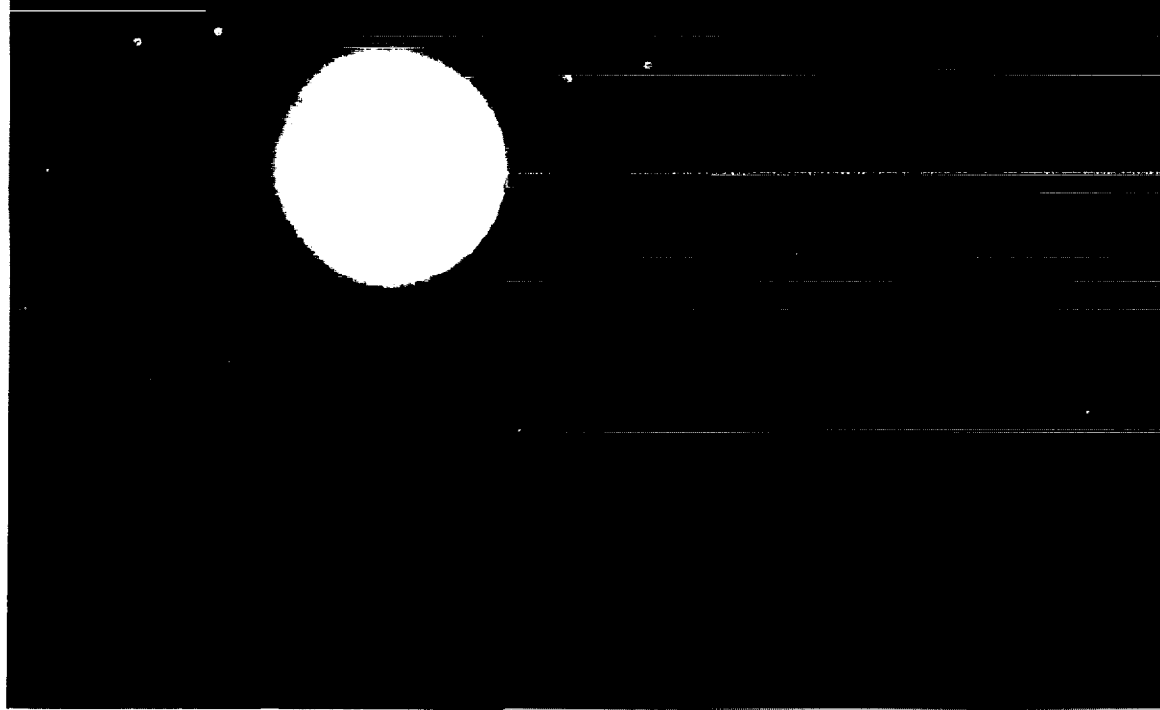
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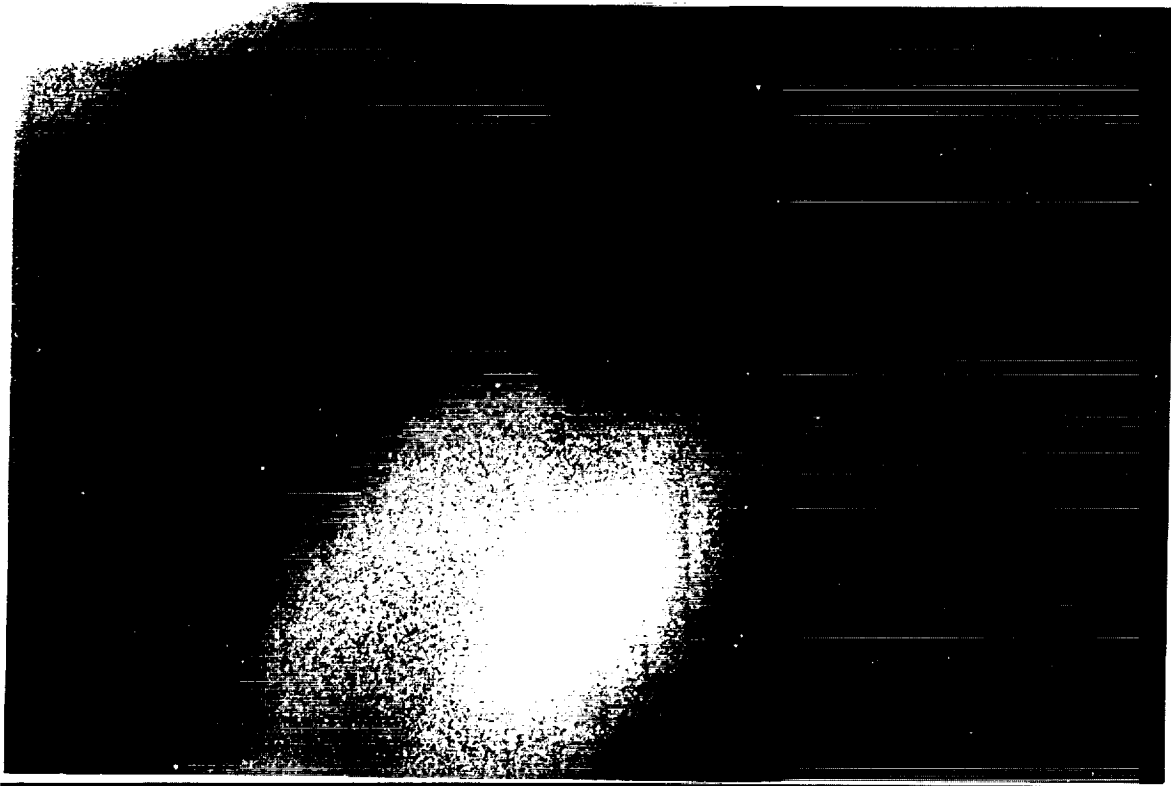
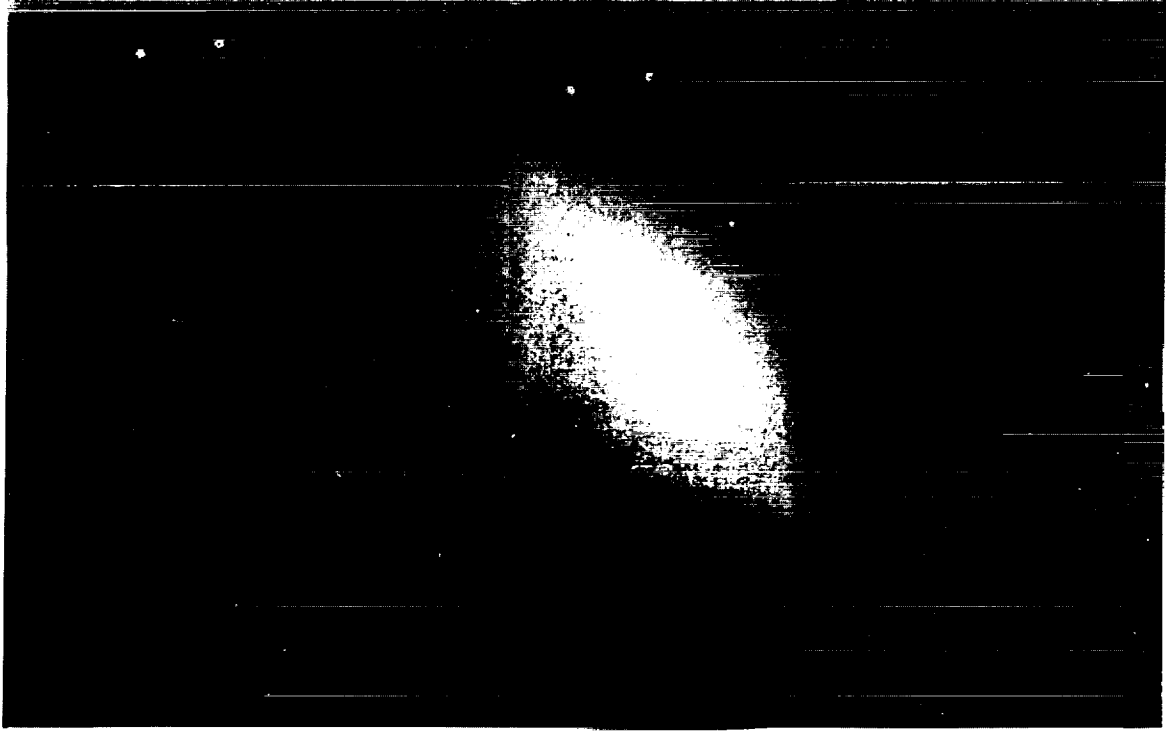
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